Study for the quality assessment of abstracts presented to Italian public health national conferences: a six years survey.

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Abstract

Background:

Oral and poster presentations at congresses are essential to spread scientific knowledge among the medical community. Many scientific societies have analyzed the quality of papers presented at their meetings but no information on abstracts' evaluation has been presented in Public Health field.

Design and methods:

This study aims to examine the quality of abstracts presented at annual meetings of Italian Public Health Society (SItI) in the period 2005-2010 through a validated checklist grid, evaluating eight dimensions: Inherency, Structure, Originality, Objectives, Study design, Sources, Results, Conclusions. Each item was scored from 0 to 3 points (max score: 24) and we used the average score in our study (15) as threshold of good quality. A multivariate analysis was performed in order to investigate predictors of score of abstracts presented.

Results:

A total of 4,399 abstracts (1,172 oral communications, 3,227 posters) was examined. Around 60% were submitted by Universities and around 40% were from Central Italy. The highest quality was found in the fields of Vaccines (average score 18.9), Infectious Diseases (18) and in abstracts submitted by Universities (16.4). Predictors of lower quality identified were geographical area and affiliation ($p= 0.002$). Abstracts containing well-written Results, Conclusions and Objectives (3 points) were more likely to be of high quality (OR=55.6, OR=41.9, and OR=157.4; $p <0.001$).

Conclusions:

This is the first European study evaluating the quality of abstracts in the public health field. A reliable evaluation tool is fundamental to offer a transparent methodology of assessment and to improve the quality of research.

Key words:
Public Health, congresses, education, quality, abstracts

Parole chiave:
Sanità Pubblica, congressi, educazione, qualità, abstract

Introduction

Oral and poster presentation sessions at conferences and congresses have been internationally recognized as essential moments in which scientific knowledge becomes available to the scientific community, as occasion for training and retraining for those who take part, and as an important element of scientific progress (1-3). Indeed, these events promote and facilitate collaboration between professionals and research groups from all over the world and frequently this information can be used as support for decision-making process by those who work in the health field. The quality of the information presented in an abstract is often related to the scientific quality of the research itself. For this reason abstracts can be used as ba proxy of the quality of the researches presented. It is the 'visiting card' of the work through which the editors may bdecide whether or not to send the paper forward for peer review (4). Even when the abstracts are not published in indexed and peer-reviewed journals, they still represent an important part of the grey literature which is often included in meta analyses (2, 3, 5, 6). Many medical scientific societies and associations began therefore to evaluate the quality of work presented during their meetings. However, none of these in Italy or in other countries, are part of the Public Health Service sector (7-10). The Italian Public Health Society ("Società Italiana di Igiene - SItI) was founded in 1921. It is a national authoritative reference in Public Health field for the Italian National Health Service. The SItI is made up of multidisciplinary professionals (i. e. medical doctors, technicians, health workers…) who share the common objective to promote medical and cultural advancement in various fields, such as hygiene, epidemiology, public health services, preventive and community medicine, health economics, health care management, planning and organization. Each year, the members of the Society present their research work to the scientific community at the annual national conferences. Works presented are sent in the form of abstracts by professionals and research groups from all over Italy and are subjected to the selection procedures of the Society's Scientific Committee. In the period 2005-2010, there was a noteworthy increase in the scientific contribution made by Society members at these meetings with an ever growing number of abstracts selected (from 538 to 957) and participants (from 1049 in 2005 to1200 in 2010) (11).
The selection procedures to which the works presented by the scientific societies members are subjected have already been underlined in the literature. It is recognized a difficulty to make an objective evaluation of the abstracts quality, especially because of the lack of standardized evaluation methods which could make the selection process more reliable and guarantee an objective quality standard (12,13). Checklists and methods of quality evaluation based on a points system have been studied and made public in full clinical research reports, but none of them have been validated and made available to the international scientific community to evaluate abstracts in the public health field (14). Instead, only technical suggestions in order to ensure that the format and content of abstracts correspond to internationally validated criteria are available (15-19). Our study aims to examine the quality of the abstracts published in the Abstract Books of SItI annual national meetings in the period 2005-2010, through the creation of a specific evaluation method suitable and exploitable in other contests of scientific contribution assessment.

Methods

The study started in January 2010, when a protocol was set up by teachers and students of the Postgraduated School in Public Health at the Universities of Turin and Milan. The study protocol consisted of the following steps:
a) Eight issues checklist grid for the abstracts assessment and the "Record Book" with instructions for the grid compilation;
b) Access 2007 database creation to upload the anonymous abstracts;
c) Pilot study for the validation of the checklist grid;
e) Evaluation of the abstracts;
f) Analysis of results.

Checklist grid

The checklist grid used as evaluation form is made up of two parts. An administrator compiled the first part, dedicated to data collection of abstract "anagraphic" details. This part was performed by an external administrator in order to make "anonymous" the abstracts before the evaluation of quality through the checklist grid and to prevent possible biases due to "conflict-of-interest". The nine anagraphic details required in this anagraphic section were the following: year of the conference/congress; specific congress session; type of presentation (oral or poster); title of abstract; name of 1st author; affiliation (university, hospital, public health authority); regional location of 1st author. Moreover, each abstract was assigned an identification code which allowed to bring any work to own identifying data. The second part of checklist grid was composed by eight items dedicated to the evaluation of the quality: Inherency (suitability of the abstract content to the congress session to which it was submitted); Structure (subdivided into Introduction, Materials and Methods, Results, Discussion and Conclusions); Originality of the study; Description of Objectives; Study Design; Description of data sources; Description of results; Conclusions, discussion and practical implications of the study. For each item, the researcher involved in the evaluation procedure can assign a score from 0 to 3 points on the basis of the information found in the abstract itself (maximum total score for each abstract was then 24).

Creation of the database

Data were collected within a database created using Microsoft Access 2007. A "Reviewer code" was assigned to each researcher involved in the evaluation procedure (using initials of first and last name) and each anonymous abstract was inserted following the order of its ID Code. The reviewers were 11 students from the Postgraduated School in Public Health of the Universities of Turin and Milan. To facilitate the analysis, all congress sessions were subdivided according to subject matter into 11 main groups (congress session groups): Food and Nutrition; Health Education; Organization; Vaccines; Epidemiology of Infective Diseases; Epidemiology of Chronic Degenerative Diseases; Environment; Hospital Hygiene; Miscellaneous; Dental Hygiene; Others. Abstracts relating to different subjects but not attributable to specific groups were put in the 'Miscellaneous' group. Some abstracts did not correspond to any of the groups due to the fact that in three annual meetings (2005, 2006 and 2010) the posters were published without a division in specific congress sessions. In this case, the abstracts were inserted in the 'Others' group.

Pilot Study (Inter-rater agreement among reviewers)

Twenty anonymous abstracts were randomized to estimate the level of agreement among researchers and to validate the checklist and the previously prepared record book (RB, Table 1). The RB contains, for each individual item, the criteria for the evaluation and the corresponding score. These 20 abstracts were then distributed to the reviewers taking part in the study who individually evaluated each of them separately. After this pilot study and the assessment of agreement between referees (using Intraclass Correlation Coefficients - ICC) the RB was formalized in order to have a standardized and rigorous evaluation method to fill each checklist grid. About the inter-rater agreement during pilot study we decided that each referee should have rate all the 20 abstracts selected for the pilot study. In order to measure rater agreement we used the following classification previously used in literature: ICC<0.20 "slight agreement"; 0.21-0.40 "fair agreement"; 0.41-0.60 "moderate agreement"; 0.61-0.80 "substantial agreement"; >0.80 "almost perfect agreement".

Quality of abstracts Evaluation

Each reviewer evaluated, using the checklist grid, around 400 randomly assigned anonymous abstracts (for a total of 4,399 abstracts), published in the Abstract Books of the SItI in the period 2005-2010. The evaluation step started in March 2010 (March 2010: Pilot Study) and was completed in February 2011.

Data analysis

An initial descriptive statistical analysis was performed with continuous variables expressed in terms of mean and standard deviation (if normally distributed) or mean and interquartile range. Categorical

variables were expressed in percentage. The average score found in our study (15/24) was used as threshold value to identify "good quality" abstracts. The percentages of good quality abstracts were used to identify temporal trends according to geographic area and affiliations. Finally, a multivariate analysis was performed in order to investigate potential predictors of abstracts quality. Level of significance was set at pδ0.05. All the analysis were performed using STATAMP 11 software.

Results

Inter-rater Agreement

During the pilot study the inter-rater reliability validation was performed. The amount of agreement within the eight individual criteria of the evaluation checklist was measured by Intraclass Correlation Coefficient (ICC). Only one criteria-level ICCs exceeded 0.40 (Structure 0.49, p<0.001). The other criteria-levels ICCs were 0.34 Inherency, 0.07 Originality of the study, 0.38 Description of Objectives, 0.20 Study Design, 0.25 Description of data sources, 0.37 Description of results, 0.15 Conclusions, discussion and practical implications of the study. All the results reported a p<0.001.

Abstracts evaluation

In the period 2005-2010, 4,399 abstracts (1,172 reports and 3,227 posters) were included in the Abstract Books of the SITI congresses and conferences, with a clear growing trend in the number of abstracts published. Most represented categories of topics were: Organization (n=521; 12%) and Health Education (n=478; 11%), followed by Hospital Hygiene (8%), Food and Nutrition (/%), Infective Diseases (7%), and Chronic Diseases (5.8%). The most frequent affiliation were Universities (n=2,327; 60%), followed by Hospitals (n=1,121; 29%) and local Public Health institutions (n=449; 11%). The distribution vary also according to geographic area with a prevalence of abstracts from Central Italy (n=1,709; 39%), followed by South (n=1,379; 31%) and North (n=939; 21%). In 9% of abstracts (n=379) it was not possible to track a specific regional location. We calculated the average score among all the abstracts reviewed, identifying a value of 15 (range 0-24) and we used this value as discrimination threshold of good/ low quality of the abstracts (Table 2). Oral communications showed an average score higher than posters (15.9 vs 14.8). Some conference sessions reported an higher average score, such as Vaccines (18.9), Epidemiology of Infectious Diseases (18) and Hospital Hygiene (17.8), while the abstracts with lowest average marks (13) belonged to the Miscellaneous group (but probably it was not possible to assign to these abstracts a score in the "Inherency" item). Finally, according to the affiliation, the highest average score was the one of Universities (16.4), followed by Hospitals (14.2) and local Public Health institutions (13.8). In order to analyze different levels of quality, total scores (from 0 to 21 points, not considering the points awarded for Inherency, since it was the conference scientific committee and not the author to propose the session for each abstract) were subdivided in three categories: - 0-7 points: Very poor quality abstracts - 8-14 points: Poor quality abstracts - 15-21 points: Good quality abstracts. Table 3 shows the percentages of "Good quality" abstracts for each year, according to geographic area and affiliation.
The highest percentages of good quality abstracts were reported for the academic affiliation, with scores always above the average, while lowest percentage were found among "Hospital" and "Local institutions" abstracts with values below the mean percentage. Over the years it was registered a fluctuating but growing trend of abstracts quality (Figure 1).

Multivariate analysis

A multivariate analysis, through a logistic regression model, was then performed in order to identify potential predictors of abstracts good quality (Table 4). Factors influencing in a negative way the quality of abstracts seem to be the geographic area (Southern Italy OR 0.67; p<0.001), affiliation (Hospital OR 0.67; p=0.002). Good quality, instead, was related with the maximum score (3 points) awarded in some

specific items, such as Description of Results (OR 55.64; p<0.001), Conclusions and discussion and practical implications of the study (OR 41.87; p<0.001) and Objectives (OR 157.42; p<0.001).

Discussion

This paper aimed to analyze the quality of abstracts presented at the Annual meetings of the Italian Public Health Society (SItI) in the period 2005-2010. The reason of added value of our research lies in the society composition itself. IndeedSItI is composed by professionals from many different healthcare areas with a wide range of qualifications and skills. This peculiarity makes the evaluation and selection procedure of abstracts before a conference very hard to complete without a tool able to distinguish the works that are worthy of consideration among the thousands presented. This study enabled us to develop and validate an analytical assessment tool that could be adapted and used in many sectors. Indeed, the checklist grid resulted very quick to fill andeasy in its compilation, a characteristic essential for those who are committed to evaluate a large number of abstracts in a limited period of time. In recent years the number of abstracts presented at SItI conferences increased constantly. This is explainable not only in consideration of scientific interests development among the different groups, but also as a consequence of the regulatory and organizational indications of the national health service and of regional and local affiliations/departments. In this regard, the progressive increase in the numberof papers submitted could be the result of the greater focus on public health issues which involves an even growing number of medical students. This is due in part to the possibility for students to receive credits (required for the students' professional training) and fee cover for the participation at these meetings. The costs coverage and the participation permit by students affiliations are in many cases available only when the student produces a scientific contribution for the event. Another interesting result of our study concerns the relationship between quality and topic of abstracts. Oral communication dealing with Organization and Health Education issues are continuously increasing. This is probably due to the ever greater importance given to the reorganization of the health service on a national level and to the demands of the institutions themselves to strengthen education in prevention and health promotion sectors. Abstracts concerning Food and Nutrition field are characterized too by a huge number and high scores of quality, probably because in this sector the experimental studies are very common. We found a greater attention in data sources description and an easier and clearer exposition of results. Another frequently quality-related topic are Vaccines, that have been a central issue for many years with a consequent large and extremely valid body of related scientific literature of reference.

Many abstracts with high scores were proposed by universities and this is probably due to a greater attention and interest of academic authors in publishing their research. Furthermore, in Italy doctors in postgraduate training in public health play an important role in research and most of them are studying and working in Universities. With respect to geographical origin, most of the abstracts were from Central and Southern Italy. However, from a quality point of view, the abstracts from Northern and Central Italy achieved higher scores than from Southern Italy.

A constant improvement in the quality of the abstracts has been registered over the years. In particular, the greatest improvement was seen in the period between 2008 and 2009. Indeed, in 2009 the Scientific Committee of the SITI introduced a predefined abstract form with a necessary application requirement in order to ensure an appropriate format and structure of the scientific contribution, and to provide specific criteria as help during the selection procedure. Quality of abstracts is also strictly related in our study with the attribution of the highest score to the items representing the description of the aims of the study, the results and the conclusions. In particular, the results should be written clearly and should contain numbers and data easily understandable and correlated to the objectives. It is also important to underline that the present study represents the first Italian and European study of revision and evaluation of the quality of abstracts submitted to national public health and hygiene meetings.

However, this study presents some limitations that deserve discussion. First of all the formulation of a single evaluation form for papers covering a big variety of topics and research methods like those of the SITI and, more generally, for the public health sector. However, this circumstance allowed us to produce a selection procedure that may be used not only for Hygiene and Public Health conferences, but also in other scientific fields. Methods of agreement between researchers involved in the evaluation

process were discussed in detail during the staff meetings. In this occasion, the Record Book was an essential tool providing researchers a standardized way of scoring the eight items of the evaluation form correctly. This drastically reduced the margins of difference in interpretation of the individual researchers involved. The Record Book was created through the participation of all the researchers involved in the evaluation process in meetings and discussions. Problems and uncertainties were shared and resolved in a collaborative process of discussion and decision making through brainstorming sessions involving all the staff members. The analysis of all the study population eliminated any possible selection bias in the results.

Conclusions

Our study shows that a well structured evaluation method could be the key for a transparent selection procedure and eventually for an improvement in the quality of the research itself. This is the first European study evaluating the quality of scientific events in the public health and hygiene sector. It could, therefore, provide the basis of a common system of evaluation and selection which could also help researchers in the scientific community to produce good quality abstracts.

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Table 1 - Record Book Summary

Criterion	Score	Description
Inherency	0	No inherency or Inappropriate inherency
	1	Low inherency
	2	Medium inherency or miscellaneous group
	3	Appropriate inherency
Structure (Subdivision in Introduction, methods, results and conclusions)	0	Total absence of subdivision despite request
	1	Incomplete subdivision and/or lack of paragraphs
	2	Subdivision not completely stated but recognizable
	3	Complete and correct subdivision in Introduction, methods, results and conclusions.
Originality of the Study	0	Repetition of previous work
	1	Already debated topic and poor added value
	2	Hot topic but poor added value
	3	Novel approach and added value on a hot topic
Description of objectives	0	Unstated
	1	Inappropriate and does not reflect the results
	2	Clear, but not detailed
	3	Clear and comprehensive
Study design	0	Unstated/Completely inappropriate design
	1	Partially inappropriate design
	2	Acceptable design
	3	Excellent design
Description of data sources	0	Unstated
	1	Inappropriate or totally unclear description
	2	Incomplete description of data sources
	3	Clear and comprehensive description of data sources
Description of results	0	Unstated
	1	Poor and unclear description of results
	2	Complete but unclear description of results / Clear but incomplete description of results
	3	Clear and comprehensive description of results
Conclusions and discussion	0	Unstated
	1	Poor implications and discussion of results
	2	Unclear or incomplete discussion of results and implications
	3	Clear and comprehensive discussion of results and implications

Table 2 - Number of abstracts (Oral communication, posters, total) and mean average scores according to year, congress session, affiliation and geographic area.

		2005	2006	2007	2008	2009	2010	Full period	Average Score
Abstract	Oral	86	236	209	311	166	164	1172	15.9
	Posters	454	501	481	320	678	793	3227	14.8
	Total	540	737	690	631	844	957	4399	15.1
Affiliation									
University	Oral	49	132	136	181	97	99	694	17.0
	Posters	249	245	271	156	317	395	1633	16.1
	Total	298	377	407	337	414	494	2327	16.4
Hospital	Oral	19	37	31	66	38	35	226	14.9
	Posters	93	85	136	127	201	253	895	14.0
	Total	112	122	167	193	239	288	1121	14.2
Local Public Health institution	Oral	4	17	21	26	17	19	104	14.6
	Posters	52	47	32	19	112	83	345	13.5
	Total	56	64	53	45	129	102	449	13.8
Geographic area									
Northern Italy	Oral	21	41	52	59	23	54	250	16.1
	Posters	105	97	96	71	137	183	689	15.0
	Total	126	138	148	130	160	237	939	15.3
Central Italy	Oral	43	60	88	118	66	64	439	16.2
	Posters	194	171	231	133	232	309	1270	15.5
	Total	237	231	319	251	298	373	1709	15.7
Southern Italy	Oral	13	92	56	103	65	31	360	15.9
	Posters	106	133	138	103	279	253	1012	14.6
	Total	119	225	194	206	344	284	1372	14.9
ND	Oral	9	43	13	31	12	15	123	14.4
	Posters	49	100	16	13	30	48	256	12.0
	Total	58	143	29	44	42	63	379	12.8

Table 3 - Good quality abstracts according to the indexes used (%) for year, macroarea and institutions.

Good quality abstracts (15-21 points)	2005	2006	2007	2008	2009	2010
	(%)	(%)	(%)	(%)	(%)	(%)
Affiliation						
University	51.68	37.93	63.64	49.55	74.15	69.64
Public health authority	26.79	10.94	33.96	46.67	55.81	41.18
Hospital	25.00	17.21	47.31	33.68	61.92	43.75
Geographic Area						
North	41.27	29.71	62.84	34.62	70.63	58.65
Central	45.57	34.20	58.31	49.40	74.83	60.32
South	33.61	22.67	46.39	41.26	59.30	55.63
ND	44.83	27.27	51.72	43.18	69.05	46.03
Total	41.85	28.49	55.65	43.26	67.42	57.58

Table 4 - Potential predictors of good quality abstracts.

	Good quality	Odds Ratio	CI:95 %	P
Geographic area	Central	Ref		
	ND	0.86	(0.48 - 1.53)	0.611
	North	0.80	(0.60 - 1.05)	0.108
	South	0.67	(0.52 - 0.86)	0.002
Institution	University	Ref		
	Local Public Health institution	0.87	(0.61 - 1.25)	0.468
	Hospital	0.67	(0.52 - 0.86)	0.002
Year	2005	Ref		
	2006	0.63	(0.41 - 0.97)	0.037
	2007	1.10	(0.64 - 1.87)	0.728
	2008	0.87	(0.51 - 1.49)	0.619
	2009	1.40	(0.81 - 2.41)	0.233
	2010	2.46	(1.64 - 3.68)	<0.001
Description of Results (score)	0 points	Ref		
	1 points	2.79	(1.51 - 5.13)	0.001
	2 points	13.00	(7.40 - 22.81)	<0.001
	3 points	55.64	(31.82 - 97.30)	<0.001
Conclusions (score)	0 points	Ref		
	1 points	4.20	(2.64 - 6.66)	<0.001
	2 points	11.84	(7.70 - 18.21)	<0.001
	3 points	41.87	(26.79 - 65.42)	<0.001
Objectives (score)	0 points	Ref		
	1 points	5.39	(1.89 - 15.34)	0.002
	2 points	23.72	(8.72 - 64.54)	<0.001
	3 points	157.42	(57.75 - 429.11)	<0.001

Figure 1 - Trend towards Good Quality according to geographic area (A) and affiliation (B).